CHAPTER 12: AIR QUALITY

12.1. INTRODUCTION

The construction and operation of the proposed emergency ventilation plant for the 8th Avenue and 7th Avenue Subway Lines has the potential to impact local air quality levels.

Construction-phase analyses conducted for this project evaluate the potential impacts associated with both mobile and stationary emission sources. The *mobile source* analysis was conducted to estimate the potential air quality impacts of changes in traffic conditions caused by the addition of construction-related trucks onto the roadway network and the lane closings needed to accommodate construction operations. The *stationary source* analysis was conducted to estimate the potential air quality impacts of emissions generated by earth excavation and grading, on-site handling of excavated material and debris, and the operation of heavy-duty diesel and gasoline-powered construction equipment.

An evaluation of the potential air quality impacts of the operational phase of the proposed emergency ventilation plant was also considered. However, since the plant would operate only during emergency conditions and for limited periods for routine equipment maintenance and testing, no detailed operational-phase analysis was deemed warranted.

This section presents a discussion of existing ambient (outdoor) air quality conditions in the project area, air quality standards and regulatory requirements applicable to this project, methodologies utilized in the evaluations, and the results of mobile and stationary construction-phase impact analyses of the proposed project alternatives.

12.1.1. RELEVANT AIR POLLUTANTS FOR ANALYSIS

Air quality is regulated at the Federal and State level under the 1970 federal Clean Air Act (CAA) (42 U.S. C). In accordance with this Act, there are a number of air pollutants that have been identified by the United States Environmental Protection Agency (EPA) as being of concern nationwide. These pollutants, known as “criteria pollutants,” are carbon monoxide (CO), nitrogen dioxide (NO_2), ozone, particulate matter smaller that 10 microns (PM_{10}), particulate matter smaller that 2.5 microns ($PM_{2.5}$), sulfur dioxides (SO_2), and lead (Pb). Ambient concentrations of CO and ozone in the project area are predominantly influenced by motor vehicle activity. NO_2 is emitted from both mobile and stationary sources. Emissions of SO_2 are associated mainly with stationary sources. Emissions of particulate matter are associated mainly with stationary sources (construction equipment) and diesel-fueled mobile sources (heavy trucks and buses). Lead emissions, which historically were principally influenced by motor vehicle activity, have been substantially reduced, due to the elimination of lead from gasoline.

National Ambient Air Quality Standards (NAAQS) are concentrations set for each of the criteria pollutants specified by EPA (49 CFR 50) that have been developed to protect human health and welfare. The CAA defines nonattainment areas as geographic regions that have been designated as not meeting one or more of the NAAQS. The CAA requires that a State Implementation Plan (SIP) be prepared for each nonattainment area, and a maintenance plan be prepared for each former nonattainment area that subsequently demonstrated compliance with the standards. The SIP is a state’s plan on ways it will meet the NAAQS under the deadlines established by the CAA. Manhattan is designated at a nonattainment area for ozone, PM_{10}, and $PM_{2.5}$, and a maintenance area for CO. In addition to NAAQS, the New York State Department of Environmental Conservation (NYSDEC) has developed “significant threshold values” (STVs) for $PM_{2.5}$ that are used to determine whether potential air quality impacts of a proposed project are significant. As such, for the proposed project alternatives:

- Maximum estimated construction-phase pollutant concentrations are compared to the NAAQS to determine whether construction activities would cause or exacerbate an exceedance of these standards; and
- Maximum construction-phase CO and $PM_{2.5}$ impacts are compared to applicable STVs to determine whether the construction-phase impacts of the proposed alternatives are considered to be significant.

12.1.2. CONSTRUCTION PHASE ENVIRONMENTAL PERFORMANCE REQUIREMENTS

The MTA NYC Transit has committed to minimizing air quality impacts from its major construction projects. Accordingly, construction of the Build Alternatives would be implemented with incorporation of minimum performance requirements that contractors must incorporate in a project's construction, including:

- The use of ultra low sulfur diesel (ULSD) fuel, which has a sulfur content of less than 15 parts per million (ppm);
- The use of retrofit technology in heavy-duty engines and off-road construction vehicles operating during the construction of the proposed emergency ventilation plant;
- A dust control plan that would include spraying of a (non-hazardous, biodegradable) suppressing agent on disturbed soil and other surfaces, containment of fugitive dust; and adjustment of work practices to reflect meteorological conditions as appropriate; and
- A soil erosion sediment control plan.

These requirements would be part of the project's Construction Environmental Protection Program (CEPP), which is described in Chapter 4.

12.1.3. CONCLUSIONS

The result of the analysis of construction-phase impacts of the emergency ventilation plant during the peak construction period (2010) with the implementation of the MTA NYC Transit construction performance requirements is that construction activities would not cause exceedances of NAAQS under any of the Build Alternatives or impacts greater than the NYSDEC STVs. As such, the potential air quality impacts of the proposed alternatives, with the implementation of the construction performance requirements, are not considered to be significant.

Table 12-1 provides a summary of the potential impacts associated with the construction and operation of the No-Action and Build Alternatives.

TABLE 12-1: SUMMARY OF COMPARISON OF ALTERNATIVES: AIR QUALITY

Alternative	Construction	Operation
No-Action	No impacts	No impacts
The Preferred Alternative	No exceedance of an NAAQS or a NYSDEC STV	No measurable mobile/stationary source impacts
SB1	No exceedance of an NAAQS or a NYSDEC STV	No measurable mobile/stationary source impacts
SB5	No exceedance of an NAAQS or a NYSDEC STV	No measurable mobile/stationary source impacts

12.2. STUDY AREA

The study area for the analysis of air quality impacts comprises the three alternative sites for the proposed emergency ventilation plant (the Preferred Alternative and Alternatives SB1 and SB5) and the surrounding street network that could be affected by construction traffic associated with each alternative. Figure 12-1 shows the vent plant locations that were considered for analysis as well as the project's immediate study area. Vehicular emissions generated on all major roadway links with this area were included in the mobile source analysis and the effects of emissions from the construction activities projects for each alternative site were estimated at both ground level (sidewalk) and elevated (windows and terraces) receptor sites surrounding each potential construction area.

12.3. POLLUTANTS

12.3.1. CRITERIA POLLUTANTS

The following air pollutants have been identified by the EPA as being of concern nationwide: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone, particulate matter smaller that 10 microns (PM_{10}), particulate matter smaller that 2.5 microns ($PM_{2.5}$), sulfur dioxides (SO_2), and lead (Pb). In New York City, ambient concentrations of CO and ozone are predominantly influenced by motor vehicle activity. Nitrogen oxides (which form NO_2 in the atmosphere) are emitted from both mobile and stationary sources. Emissions of sulfur oxides (which include SO_2) are associated mainly with stationary sources, and emissions of particulate matter are associated with stationary sources, and to a lesser extent, mobile sources and fugitive dust. Lead emissions, which historically were principally influenced by motor vehicle activity, have been substantially reduced due to the elimination of lead from gasoline.

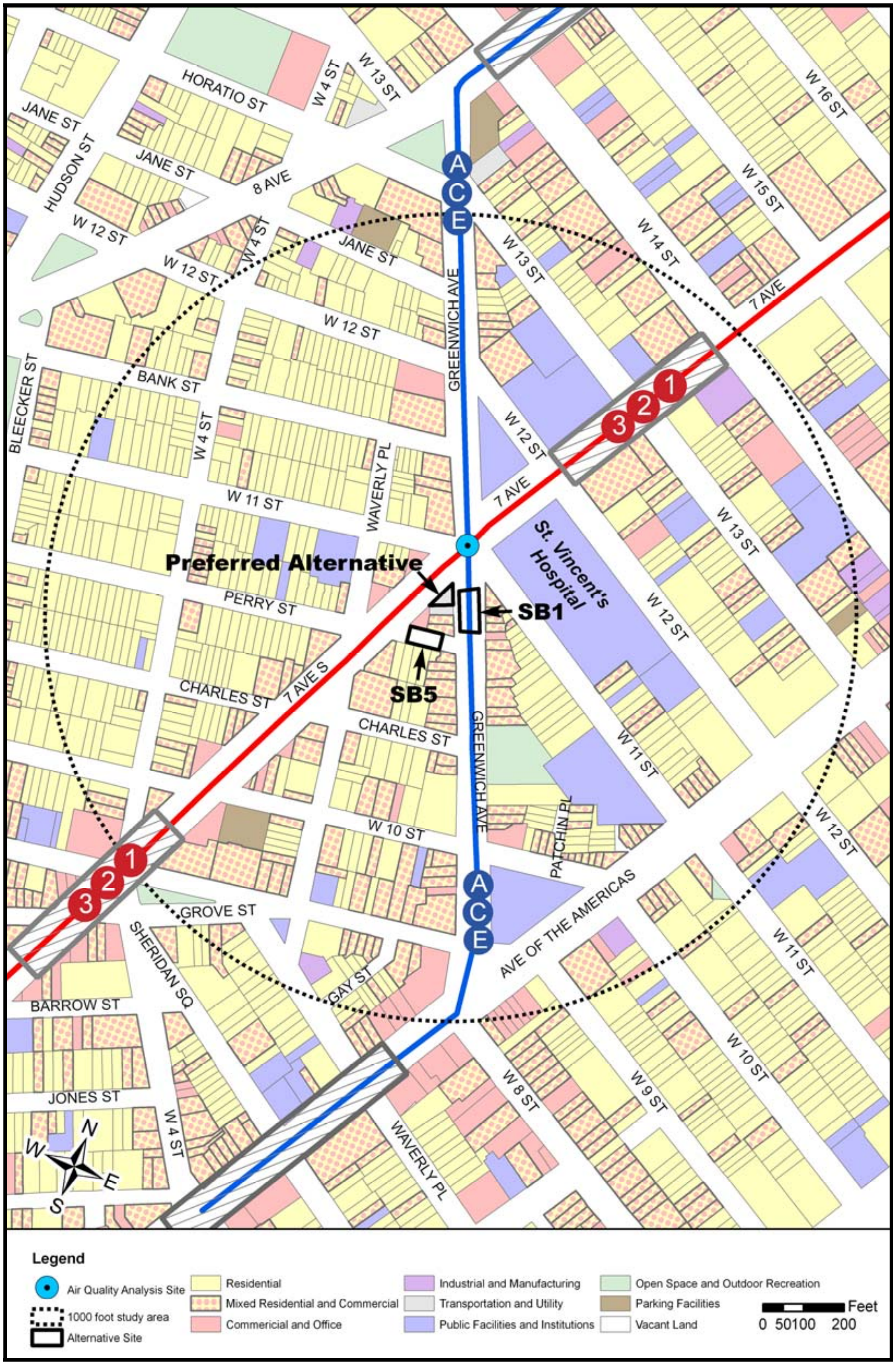
CARBON MONOXIDE

CO is a colorless and odorless gas that is generated in the urban environment primarily by the incomplete combustion of fossil fuels in motor vehicles. In New York City, more than 80 percent of CO emissions are from motor vehicles. Prolonged exposure to high levels of CO can cause headaches, drowsiness, loss of equilibrium, or heart disease. CO concentrations can vary greatly over relatively short distances. Relatively high concentrations of CO are typically found near congested intersections, along heavily used roadways carrying slow-moving traffic, and in areas where atmospheric dispersion is inhibited by urban "street canyon" conditions. Consequently, CO concentrations were estimated in this analysis on a localized, or microscale, source basis, and these results compared to the NAAQS.

OZONE AND NITROGEN DIOXIDES

Hydrocarbons include a wide variety of volatile organic compounds, emitted principally from the storage, handling, and use of fossil fuels. Nitrogen oxides constitute a class of compounds that include NO_2 and nitric oxide, both of which are emitted by motor vehicles and stationary sources. Both hydrocarbons and nitrogen oxides are of concern primarily these compounds react in the presence of sunlight to form ozone. This reaction occurs comparatively slowly and ordinarily takes place far downwind from the site of actual pollutant emission.

FIGURE 12-1: AIR QUALITY STUDY AREA



The effects of these pollutants are normally examined on an areawide, or mesoscale, basis. However, since construction of the vent plant would not significantly increase the amounts of these emissions generated within the region (and generate almost no emissions during the operational phase of the project), a regional analysis of air quality impacts of these emissions is not warranted. Localized NO_2 impacts from the effects of diesel-fueled construction equipment, however, were estimated, and the results compared to the NAAQS..

LEAD

Lead emissions are principally associated with industrial sources and motor vehicles using gasoline containing lead additives. As the availability of leaded gasoline has decreased, motor vehicle-related lead emissions have decreased, resulting in a significant decline of concentrations of lead. Atmospheric lead concentrations in New York City are well below national standards. Lead concentrations are expected to continually decrease; therefore, an analysis of lead from mobile sources is not warranted.

SULFUR DIOXIDE

High concentrations of SO_2 affect breathing and may aggravate existing respiratory and cardiovascular disease. SO_2 emissions are generated from the combustion of sulfur-containing fuels — oil and coal — largely from stationary sources such as coal and oil-fired power plants, steel mills, refineries, pulp and paper mills, and nonferrous smelters. In urban areas, especially in the winter, smaller stationary sources such as space heating contribute to elevated SO_2 levels.

Although diesel-fueled heavy-duty vehicles also emit SO_2, transportation sources and construction equipment are not considered by the EPA (and other regulatory agencies) to be significant sources of this pollutant that should be quantitatively evaluated in a mobile source impact analysis. In addition, there has not been a recorded exceedance of a SO_2 NAAQS in New York City in many years. As such, an analysis of SO_2 impacts is not warranted.

PARTICULATE MATTER

Particulate matter is a broad class of air pollutants that exist as liquid droplets or solids, with a wide range of sizes and chemical composition. Particulate matter is emitted by a variety of sources, both natural and man-made. Natural sources include the condensed and reacted forms of natural organic vapors, salt particles resulting from the evaporation of sea spray, wind-borne pollen, fungi, molds, algae, yeasts, rusts, bacteria, and debris from live and decaying plant and animal life, particles eroded from beaches, desert, soil and rock, and particles from volcanic and geothermal eruptions and forest fires. Major man-made sources of particulate matter include the combustion of fossil fuels such as vehicular exhaust, power generation and home heating, chemical and manufacturing processes, all types of construction (including that from equipment exhaust and re-entrained dust), agricultural activities, and wood-burning fireplaces. Fine particulate matter is also derived from combustion material that has volatilized and then condensed to form primary particulate matter (often after release from a stack or exhaust pipes) or from precursor gases reacting in the atmosphere to form secondary particulate matter. It is also derived from mechanical breakdown of coarse particulate matter, e.g., from building demolition or roadway surface wear.

Of particular health concern are those particles that are smaller than or equal to 10 microns (PM_{10}) and 2.5 microns ($PM_{2.5}$) in size. The potential impacts on ambient (outdoor) PM_{10} and $PM_{2.5}$ levels of both diesel-fueled construction equipment and re-entrained dust from earth moving operations were therefore estimated.

12.3.2. NATIONAL AND STATE AIR QUALITY STANDARDS AND IMPACT THRESHOLDS

NAAQS are concentrations set for each of the criteria pollutants specified by EPA that have been developed to protect human health and welfare. New York State has adopted the NAAQS as state ambient air quality standards. These standards, together with their health-related averaging periods, are presented in Table 12-2.

TABLE 12-2: NATIONAL AND NEW YORK AMBIENT AIR QUALITY STANDARDS AND SIGNIFICANT THRESHOLD VALUES

Pollutant	Averaging Period	National and NY State Standards	
		Primary	Secondary
Ozone	8 Hour	0.08 ppm (157 µg/m^3)	Same as Primary
Carbon Monoxide	8 Hour	9 ppm (10 mg/m^3)	Same as Primary
	1 Hour	35 ppm (40 mg/m^3)	Same as Primary
Nitrogen Dioxide	Annual Average	0.053 ppm (100 µg/m^3)	Same as Primary
Sulfur Dioxide	Annual Average	80 µg/m^3 (0.03 ppm)	-
	24 Hour	365 µg/m^3 (0.14 ppm)	-
	3 Hour	--	1300 µg/m^3 (0.5 ppm)
Coarse Particulate Matter (PM_{10})	24 Hour	150 µg/m^3	Same as Primary
Fine Particulate Matter ($PM_{2.5}$)	24 Hour	65 µg/m^3*	Same as Primary
	24 Hour Max STV (NYSDEC)	5 µg/m^3	-
	Annual Max STV (NYSDEC)	0.3 µg/m3	-
Lead	Calendar Quarter	1.5 µg/m^3	Same as Primary

Source: EPA; New York State Department of Environmental Conservation (NYSDEC)

* EPA recently revised the 24-hour $PM_{2.5}$ standard from 65 µg/m^3 to 35 µg/m^3. While the 65 µg/m^3 value is still applicable for demonstrating compliance with regulatory requirements (and will be used in this analysis to determine compliance with air quality standards), air quality results will also be assessed against the 35 µg/m^3 value.

ppm: parts per million

µg/m^3: micrograms per cubic meter

STV: significant threshold value

The current $PM_{2.5}$ standards were presented in the Federal Register on July 30, 2004, and became effective on that date. New $PM_{2.5}$ standards were adopted by EPA on October 17, 2006, and went into effect on December 17, 2006. They consist of a stricter 24-hour standard for $PM_{2.5}$ (35 µg/m^3) and no change to the annual $PM_{2.5}$ standard. For PM_{10}, the 24-hour standard remained the same, and the annual standard was dropped.

NYSDEC is currently reviewing monitored $PM_{2.5}$ and preparing a $PM_{2.5}$ SIP. EPA will then re-designate the study area in April 2008 for $PM_{2.5}$ based on the new 24-hour $PM_{2.5}$ standard. The area will then have approximately five years to comply with this standard. As compliance with the recently adopted $PM_{2.5}$

24-hour standard is not yet required, the currently applicable 24-hour standard (65 $\mu g/m^3$) was considered for this project. (Comparison of predicted concentrations with the project's construction phase emissions with the 35 $\mu g/m^3$ standard, however, is presented for information purposes.)

Included in Table 12-2 are the STVs for $PM_{2.5}$ established by the NYSDEC to determine whether potential air quality impacts of a proposed project are significant. NYSDEC Policy CP-33 (NYSDEC, 2003), however, was developed to assess impacts of long-term, permanent $PM_{2.5}$ emissions associated with the operation of a stationary source project with a potential to emit more than 15 tons per year of particulate matter and provides guidance to NYSDEC staff to review (air) permit applications. Policy 33 does not apply to the proposed project because:

- Only miniscule amounts of particulate matter would be emitted during the project's operational phase;
- Does not refer to the construction stage of a project, where $PM_{2.5}$ emissions are typically short-term and temporary; and
- A NYSDEC air quality permit is not required for any of the proposed project alternatives.

However, as the policy's technical guidance criteria represent the only NYSDEC metric currently available with regard to $PM_{2.5}$ emissions, the CP-33 values were used as a context for analysis of $PM_{2.5}$ levels during construction of the emergency ventilation plant, and the potential construction-phase impacts of the project were thus compared with these STVs for informational purposes.

12.3.3. POLLUTANTS FOR ANALYSIS

The study of pollutant emissions and air quality impacts as a result of the proposed emergency ventilation plant project focused on the following:

- A stationary analysis to estimate potential CO, PM_{10}, $PM_{2.5}$, and NO_2 impacts from construction operations of the proposed emergency ventilation plant, including emissions from heavy-duty diesel vehicles and equipment, and excavation and grading activities; and
- A mobile source analysis to estimate potential CO, PM_{10}, $PM_{2.5}$ impacts from changes in local traffic conditions caused by construction-related trucking operations and diversions due to lane closings.

12.3.4. MONITORED AMBIENT AIR QUALITY LEVELS

Ambient air quality monitoring data that have been collected at stations located near the study area are shown in Table 12-3. These data, which are presented to provide an indication of the pollutant levels in the area, were collected by the NYSDEC and compiled in the EPA's Airdata Database for 2006 and NYCDEC's *2006 Annual Ambient Air Quality Report*, the latest full calendar year for which data are currently available. Monitored levels are representative of the existing conditions in the study area and include both background and local influences. The monitored levels *do not exceed* national and State ambient air quality standards.

TABLE 12-3: REPRESENTATIVE MONITORED AMBIENT AIR QUALITY DATA (2006)

Pollutant	Location*	Averaging Time	Value	NAAQS
Carbon Monoxide	288 East 57th Street	8 hour	1.7 ppm	9 ppm
		1 hour	2.3 ppm	35 ppm
Nitrogen Dioxide	288 East 57th Street	Annual	0.034 ppm	0.053 ppm
Ozone	14439 Gravett, Queens	8 hour	0.078 ppm	0.08 ppm
Sulfur Dioxide	288 East 57th Street	Annual	0.010 ppm	0.03 ppm
		24 hour	0.032 ppm	0.14 ppm
		3 hour	0.064 ppm	0.5 ppm
$PM_{2.5}$	350 Canal Street	Annual	12.8 µg/m³	15 µg/m³
		24 hour	36 µg/m³	65 µg/m³
PM_{10}	350 Canal Street	24 hour	60 µg/m³	150 µg/m³

Source: EPA AirData (http://epa.gov/airdata).
* Sites closest to the project area

12.3.5. BACKGROUND VALUES

In assuming the total impact of a proposed action, it is necessary to include consideration of the background pollutant levels for local conditions in the study area. The background level is the component of the total concentration not accounted for through the microscale modeling analysis. Applicable background concentrations were added to the modeling results to obtain total pollutant concentrations at each receptor site. Background concentrations are based on the monitored values collected by the NYSDEC (2006 Ambient Air Quality Report). These values were added to the modeling results to obtain total pollutant concentrations at each receptor site for each analysis year. The background values used in the mobile and stationary source analyses are provided in Table 12-4.

TABLE 12-4: BACKGROUND CONCENTRATIONS

Pollutant	Time Period	Background Concentration	Monitoring Station	Years of Monitored Data
CO[1] (ppm)	8 Hours	2.9 ppm	NYSDEC Stations	1991–1996
NO_2[2] (µg/m³)	Annual	71 µg/m³	Mabel Dean HS	2001-2005
PM_{10}[3] (µg/m³)	24 Hours	46 µg/m³	Mabel Dean HS	2002-2004
$PM_{2.5}$[4] (µg/m³)	24 Hours	38 µg/m³	350 Canal St.	2004–2006
	Annual	14.3 µg/m³	350 Canal St.	2004–2006

Source of background values:
1. The *New York State Department of Transportation's Environmental Procedures Manual*, Chapter 1.1, Table 9 and NYCDEP.
2. The highest annual level measured at the monitoring station over five years (from 2002 to 2006).
3. The second highest concentration measured at the monitoring station from 2002 through 2004.
4. The 24-hour background concentration is an average of the 98 percentile concentrations measured at the monitoring station for years 2004 through 2006; the annual background concentration is a three-year average of annual concentrations.

12.4. KEY LAWS, REGULATIONS, GUIDELINES, AND MODELS

The key regulations, guidelines, references, and models considered in the air quality analysis conducted for this project include:

- National Environmental Policy Act (NEPA)
- CAA of 1990
- EPA NAAQS (pursuant to the CAA)
- NYSDEC adverse impact criteria – Commissioner's Policy # 33
- Construction impacts of projects on air quality are assessed in accordance with 40 C.F.R. 93.123 [Procedures for determining localized CO and PM_{10} or $PM_{2.5}$ concentrations (hot-spot analysis)]
- NYSDOT Environmental Procedures Manual
- EPA's NONROAD model for tailpipe emissions from construction equipment
- EPA's AP-42 emission factors (for fugitive-dust emissions)
- EPA's AERMOD model for stationary source dispersion analysis
- EPA's CAL3QHC and CAL3QHCR for mobile source dispersion analysis
- EPA's MOBILE 6.2.03 for estimating vehicular CO, PM_{10}, and $PM_{2.5}$ emission factors

12.5. DATA SOURCES ANALYZED

The data utilized for the analysis included:

- Existing ambient air quality data for the study area collected by NYSDEC;
- Project information, including the construction schedule, details of plans, construction equipment, and anticipated locations of staging and laydown areas for the proposed emergency ventilation plant; and
- Traffic survey data, studies, and information from the MTA NYCT project team.

12.6. MOBILE SOURCE ANALYSIS

12.6.1. METHODOLOGY

SITE SELECTION

A microscale modeling analysis was conducted that estimated CO, PM_{10}, and $PM_{2.5}$ levels near the heavily congested intersections in the study area that are anticipated to be affected by the construction of the proposed project alternatives. Three scenarios were analyzed: existing conditions (2007); and future conditions with and without construction activities for the peak construction year (2010). Future Build conditions were considered for one set of traffic conditions because construction-phase street geometries, traffic diversions, and traffic impacts (see Chapter 6) would be essentially the same for the construction of the Preferred Alternative and SB1 and SB5 alternatives.

Traffic volumes, traffic levels of service, travel speeds, and construction staging plans at major signalized intersections, which are discussed in Chapter 6, were evaluated to select sites for analysis. This analysis site selection was based on a screening analysis that was conducted using the *CEQR Technical Manual* screening threshold criteria to determine where the air quality levels would be most affected. The screening analysis used total traffic volumes at intersections, changes associated with speeds, and project-generated trips from the traffic analysis to make the final determination on the analysis site(s) for all pollutants of concern in the microscale intersection analysis. All signalized intersections in the study area were considered. The intersection of Seventh Avenue, Greenwich Avenue, and West 11th Street was selected for analysis.

RECEPTORS

The locations at which pollutant concentrations are estimated are known as "receptors." Following guidelines established by EPA, receptors were located where maximum concentrations are likely to occur and where the general public is likely to have access. For this analysis, receptors were distributed along sidewalks and at residences near the intersection selected for analysis.

TRAFFIC DATA

Traffic data for the air quality analysis were derived from traffic counts and other information developed as part of the traffic study analysis (see Chapter 6). The AM and PM peak traffic periods were considered. These are the periods when the maximum changes in pollutant concentrations are expected based on overall traffic volumes and anticipated changes in traffic patterns. These were the same periods selected for the traffic analysis.

Highway Capacity Software (2000 Highway Capacity Manual) was used to develop the traffic data necessary for the air quality analysis. The vehicle classification was determined through field data collection. Existing vehicle speeds were obtained from field measurements for the area, and adjusted to estimate future free flow speeds.

VEHICLE CLASSIFICATION DATA

Vehicle classification data required to determine composite emission factors were based on traffic survey data for the following categories: light-duty gasoline vehicles (LDGVs), sport utility vehicles (SUVs), medallion taxis, light-duty trucks, heavy-duty trucks, and buses. Light-duty gasoline trucks were divided into four groups (LDGT1 LDGT2, LDGT3, and LDGT4) based on local registration data. Based upon current CEQR guidelines, SUVs were classified as light-duty gasoline trucks with 75 percent of emissions considered as LDGT1 and LDGT2, with the remaining 25 percent as LDGT3 and LDGT4. The split between LDGT1 and 2 and LDGT3 and 4 and heavy-duty gasoline vehicles (HDGVs) and heavy-duty diesel vehicles (HDDVs) was based on NYSDEC's 2006 registration data in MOBILE 6 for each appropriate analysis year. All buses were analyzed using urban transit bus emission factors.

VEHICULAR EMISSIONS

CO emission factors were estimated using the EPA MOBILE 6.2.03 mobile emission factor algorithm model. This version includes the effects of the new vehicle standards, and covers vehicle turnover.

The following assumptions were applied in using MOBILE 6.2.03:

- NYSDEC input files with engine operating start and distribution parameters and vehicle miles traveled (VMT) for New York County were used to estimate baseline conditions;
- 2006 New York State registration and diesel sales fraction data;
- For project-generated outbound light-duty vehicles, emission factors with 100 percent cold-start conditions were used;

- For project-generated inbound LDGVs, emission factors with 100 percent hot-stabilized conditions were used;
- 100 percent hot-stabilized LDGV emission factors were used for medallion taxis, with taxi registration and mileage data;
- SUVs were assumed to be LDGTs that have the same engine operating parameters as automobiles; and
- An average winter temperature of 50 degrees Fahrenheit was used as approved by the NYCDEP and NYSDEC.

PM_{10} and $PM_{2.5}$ emission factors were estimated using EPA's MOBILE 6.2.03 emission model. Exhaust, brake, and tire wear emissions from moving vehicles were estimated for all vehicle types; idle emissions, however, were estimated only for heavy-duty diesel trucks and buses, because this information is estimated only for these vehicles (PM idle emissions from other vehicle types are considered negligible). Emissions of fugitive dust were estimated using the latest AP-42 equation (dated November 2006) for paved roads. This formula uses empirical data for fugitive dust and has recently been adjusted by the EPA to discount the contribution from exhaust and brake and tire wear emissions. Emissions from fugitive dust are dependent on vehicle weight and the surface silt loading. According to the latest NYCDEP guidelines, the following silt loading factors were used:

- 0.10 for principal and minor arterials with more than 5,000 vehicles per day (vpd)
- 0.16 for collector roadways
- 0.4 for roadways with fewer than 5,000 vpd
- 0.015 for expressways

An average vehicle fleet weight of 6,000 pounds was used for most on-street analyses.

DISPERSION ANALYSIS

Mobile source dispersion models are the basic analytical tools used to estimate pollutant concentrations from the emissions generated by motor vehicles as expected under given conditions of traffic, roadway geometry, and meteorology. CAL3QHC Version 2 is a line-source dispersion model that predicts pollutant concentrations near congested intersections and heavily traveled roadways. CAL3QHC input variables include free flow and calculated idle emission factors, roadway geometries, traffic volumes, site characteristics, background pollutant concentrations, signal timing, and meteorological conditions. CAL3QHC predicts inert pollutant concentrations, averaged over a one-hour period near roadways. This model was used to predict concentrations at affected study area intersections.

CAL3QHC predicts peak one-hour pollutant concentrations using a reasonable worst-case set of meteorological conditions (i.e., wind speeds, wind directions, atmospheric stabilities) that are recommended by EPA and peak-period traffic conditions. Different emission rates occur when vehicles are stopped (idling), accelerating, decelerating, and moving at different average speeds. CAL3QHC simplifies these different emission rates into the following two components:

- Emissions when vehicles are stopped (idling) during the red phase of a signalized intersection.
- Emissions when vehicles are in motion during the green phase of a signalized intersection.

CAL3QHCR, which is a refinement to CAL3QHC in that it uses actual meteorological data (as opposed to an assumed worst-case set of meteorological conditions), was used in all mobile source PM_{10} and $PM_{2.5}$ analyses. This more detailed level of analysis, which results in more realistic (less conservative) predicted concentrations, was applied more accurately estimate 24-hour and annual concentrations. CAL3QHCR, together with five years of actual meteorological data from LaGuardia Airport (2000-2004), were used to estimate peak 24-hour PM_{10}, and 24-hour and annual average $PM_{2.5}$ concentrations. CAL3QHC was used to predict peak 1-hour and 8-hour CO concentrations,

The analyses were conducted following EPA's Intersection Modeling Guidelines (EPA-454/R-92-005) for CO modeling methodology and receptor placement. All major roadway segments (links) within approximately 1,000 feet from the analysis site (i.e., congested intersection) were considered.

12.6.2. RESULTS

EXISTING CONDITIONS

The results of the mobile source air quality modeling analysis under existing (2007) conditions are provided in Table 12-5. The values shown are the maximum CO and PM_{10} concentrations estimated at any of the receptors near the analysis site under the time frames that correspond to the NAAQS.

TABLE 12-5: PREDICTED EXISTING CONDITIONS – MAXIMUM 8-HOUR CO AND 24-HOUR PM_{10} LEVELS

Intersection	8-hr CO (NAAQS = 9 ppm)		24-hr PM_{10} (NAAQS = 150 µg/m^3	
	ppm	Max Time Period	µg/m^3	Max Time Period
Seventh Ave./Greenwich Ave./West 11th St.	3.9	5-6 PM	80.9	5-6 PM

The results are summarized as follows:

- CO levels do not exceed the 8-hour CO standard of 9 ppm. The highest estimated concentration (3.9 ppm) occurs under the PM peak period.
- PM_{10} levels do not exceed the 24-hour standard. The highest estimated 24-hour concentration occurs under the PM peak period.

FUTURE WITHOUT THE CONSTRUCTION ACTIVITIES

A summary of the results of the mobile source air quality modeling analysis for the 2010 future without construction-related traffic is provided in Table 12-6. Future conditions include traffic growth anticipated between 2007 and 2010, and federally mandated decreases in vehicular emission factors. The values shown are the maximum CO and PM_{10} concentrations estimated at any of the receptors near the analysis site for the time frames that correspond to the NAAQS.

TABLE 12-6: PREDICTED 2010 FUTURE CONDITIONS WITHOUT CONSTRUCTION ACTIVITIES – MAXIMUM 8-HOUR CO AND 24-HOUR PM_{10} LEVELS

Intersection	8-hr CO (NAAQS = 9 ppm)		24-hr PM_{10} (NAAQS = 150 µg/m^3	
	ppm	Max Time Period	µg/m^3	Max Time Period
Seventh Ave./Greenwich Ave./West 11th St.	3.8	5-6 PM	79.4	5-6 PM

The results are summarized as follows:

- CO levels would not exceed the 8-hour standard and are lower than existing conditions due to vehicle turnover and implementation of EPA's more stringent vehicular emission control requirements. The highest estimated concentration (3.8 ppm) would occur under the PM peak period.
- PM_{10} levels do not exceed the 24-hour standard. The highest estimated 24-hour concentration (79.4 µg/m^3) occurs under the PM peak period.

FUTURE WITH CONSTRUCTION ACTIVITIES

A summary of the results of the mobile source CO and PM_{10} modeling analyses for the 2010 future with construction-related traffic is provided in Table 12-7. The values shown are the maximum CO and PM_{10} impacts estimated at any of the receptors during the peak period under the time frames that correspond to the NAAQS. These values show no change in 8-hour CO concentrations from future No Build values, only a 0.1 µg/m^3 change in 24-hour PM_{10} concentrations, and no exceedance of the NAAQS. The results of the $PM_{2.5}$ impact analysis, which are that project-related impacts are well below the STVs, are provided in Table 12-8.

TABLE 12-7: PREDICTED 2010 FUTURE CONDITIONS WITH CONSTRUCTION ACTIVITIES – MAXIMUM 8-HOUR CO AND 24-HOUR PM_{10} LEVELS

Intersection	8-hr CO (NAAQS = 9 ppm)		24-hr PM_{10} (NAAQS = 150 µg/m^3	
	ppm	Max Time Period	µg/m^3	Max Time Period
Seventh Ave./Greenwich Ave./West 11th St.	3.8	5-6 PM	79.5	5-6 PM

TABLE 12-8: PREDICTED 2010 FUTURE CONDITIONS WITH THE PROPOSED ACTION – MAXIMUM $PM_{2.5}$ MOBILE SOURCE IMPACTS

Intersection	Time Period	24-Hour	Annual Max
	Significant Threshold Value	**5**	**0.3**
Seventh Ave./Greenwich Ave./West 11th St.	Max. Impact	0.09	0.004

12.7. STATIONARY SOURCE ANALYSIS METHODOLOGY

12.7.1. METHODOLOGY

APPROACH

- The stationary source analysis that was performed to estimate the potential air quality impacts caused by the on-site (e.g., excavation activities, excavated tunnel material and rock removal, construction equipment, and truck movement) construction-phase activities included the following:

- Estimation of emissions generated by the construction activities (e.g., deconstruction, excavation, excavated materials removal, concrete and steel construction), including fugitive dust emissions and emissions released from diesel-powered equipment and trucks, at each construction site.
- Determination of a critical analysis year for each pollutant of concern based on an emission burden analysis for all years of construction activity.
- Determination of sensitive land uses near each construction site.
- Identification of the most heavily traveled truck routes, where the cumulative effects of construction activity and truck emissions could result in significant air quality impacts.
- A modeling impact analysis using the EPA AERMOD dispersion model (EPA-454/B-03-001) and five years of meteorological data of each analysis area (i.e., stationary source analysis).

EMISSION SOURCES

- Emission sources from the on-site construction activities at each of the proposed alternative sites that could potentially affect air quality levels at surrounding land uses include:
- Earth excavation, grading, and deconstruction/demolition activities;
- The handling and transport of excavated material and debris;
- Soil and spoil removal from excavation;
- Operations of heavy-duty diesel and gasoline-powered construction equipment;
- Heavy-duty diesel trucks operating within construction areas, traveling to the sites to deliver construction materials, and from sites transporting excavated spoils and deconstruction material; and
- Re-entrained dust resulting from trucks and equipment traveling on paved roadways within/near the sites.

EMISSION RATES

- Emission rates for construction activities were estimated based on the following factors, which were developed by MTA NYCT engineers (detailed operating assumptions are provided in Appendix B):
- The schedule of construction activities for each construction contract;
- The duration of each construction contract;
- The number and type of construction equipment to be used in each contract;
- Equipment horsepower (HP) and utilization rates (hours per day);
- The number of hours per day and duration of construction activities;
- The quantities of material produced and removed from each site based on the schedule of excavation and tunneling activities; and
- The number of trucks trips needed to remove the excavation material, and to bring the supply materials to each site.

OPERATING SCENARIOS

Emission rates of each pollutant from relevant sources were estimated for each type of construction activity. Given the fact that the different construction activities could range from a few months to several years (as discussed in Chapter 4), separate analyses were conducted to estimate short-term (24-hours or less) and long-term (annual average) pollutant levels. Short-term emission estimates were based on peak period activity levels at each site (defined as emissions per month). These emission estimates were used to estimate short-term (i.e., 8-hours, 24-hours) pollutant concentrations (for comparison to short-term NAAQS). Annual average activity levels were used to estimate annual concentrations (for comparison to annual NAAQS).

EMISSION ESTIMATES

- Project-specific information was applied to identify site-specific emission source parameters for use in the emission estimates and dispersion analysis. The following methodology and assumptions were applied:
- Estimated hourly emission rates of each pollutant from construction equipment, dust generating activities, and project trucks operating within each contract and construction site were summed up to compute the total monthly emission rate by pollutant, reflecting the contribution of all types of emission sources within each contract and construction site.
- Only diesel-powered construction equipment was considered in the analysis. Electric equipment was not considered.
- Each construction-related truck was considered a heavy-duty diesel vehicle with a 20-cubic yard capacity. It was assumed that trucking operations would be 8 hours per day. Truck idling was limited to 3 minutes in the analysis.
- NO_2, PM_{10} and $PM_{2.5}$, and CO emission factors for moving vehicles (i.e., exhaust, brakes, and tires) and queuing vehicles were estimated using the EPA MOBILE 6.2.03 vehicular emission factor model.
- Total daily on-site vehicular emission rates of NO_2, CO, PM_{10}, and $PM_{2.5}$ were estimated by multiplying emission factors for moving vehicles (gram/vehicle-mile) by the distance that an average vehicle would travel within the site and by the number of on-site operating vehicles during the activity period.
- Re-entrained dust from the movement of trucks and vehicles within each construction site was estimated using the current EPA equation for fugitive dust source for PM_{10} and $PM_{2.5}$ emissions. Because of low vehicular speeds within the construction areas (i.e., less than 5 mph), a speed reduction factor was applied, as appropriate.
- Emission rates of NO_2, CO, PM_{10} and $PM_{2.5}$ from diesel engines of construction equipment were estimated using the EPA NONROAD Emission Model (Report No. NR-009C, April 2004, EPA 420-P-04-009). Zero hour emission factors were adjusted for transient operation, deterioration factors, and diesel fuel sulfur content following the EPA NONROAD Model guidance.
- $PM_{2.5}$ emission factors for construction equipment were assumed to be 97 percent of the estimated PM_{10} emission factors for each type of equipment. This percentage is recommended in EPA's NONROAD Emission Model.
- Engine HP rating was provided by the project engineers; utilization factors (peak usage during the working hours) for the different types of equipment were estimated based on the EPA NONROAD Model guidance. These values were used to produce an average HP usage per day.

- The total number of working hours per week was estimated based on one 8-hour shift, 5 days per week for construction activities.
- Diesel fuel was assumed to be ULSD with a sulfur content of 15 parts per million (PPM).
- Fugitive dust emission factors for demolition, excavation, truck loading, and re-entrained dust were based on the equations recommended in EPA's AP-42 Report "Compilation of Air Pollutant Emission Factors" Sections 13.2.3.1/2/3, Heavy Construction Operations, 11.9.1 Uncontrolled Open Fugitive Dust Sources, 13.2.1 Fugitive Dust from Paved Roads. The $PM_{2.5}$ to PM_{10} ratios varied depending on the type of activity performed.

To determine when peak construction activities (and greatest emissions) would occur, emissions were estimated on a monthly, and then annual, basis for each alternative. Table 12-9 provides the estimated annual emissions of each applicable pollutant during each year of the construction phase. The values in **Bold** are the highest annual emission rates for each applicable pollutant. While this table presents annual emissions, the impact modeling analyses were based on both peak yearly and peak monthly emissions for each pollutant. As shown on Table 12-9, the Preferred Alternative indicates slightly higher annual emission in 2010 due to higher level of construction activity during that year. Based on these results, 2010 was identified as the peak construction (analysis) year for the Preferred Alternative and Alternative SB1, and the peak construction year for Alternative SB5 was identified as 2011 (see Appendix B for detailed calculations).

TABLE 12-9: ANNUAL EMISSION RATES FROM CONSTRUCTION EQUIPMENT AND ACTIVITIES

Pollutant	Construction Area	Emissions (Tons/Year)				
		2010	2011	2012	2013	2014
CO	The Preferred Alternative	**1.844**	0.833	0.544	0.921	0.000
	Alternative SB1	**1.335**	0.615	1.147	1.272	0.765
	Alternative SB5	1.316	**1.858**	1.103	0.786	0.412
NO_2	The Preferred Alternative	**1.783**	0.775	0.601	1.136	0.000
	Alternative SB1	**1.497**	0.672	1.023	1.088	0.000
	Alternative SB5	1.349	**1.465**	0.862	0.762	0.336
PM_{10}	The Preferred Alternative	**1.096**	0.577	0.397	0.264	0.000
	Alternative SB1	**0.744**	0.727	0.554	0.492	0.104
	Alternative SB5	0.650	**0.890**	0.793	0.112	0.055
$PM_{2.5}$	The Preferred Alternative	**0.370**	0.175	0.124	0.147	0.000
	Alternative SB1	**0.267**	0.177	0.211	0.216	0.101
	Alternative SB5	0.247	**0.337**	0.238	0.109	0.053

Note: Values in **Bold** represent highest annual emission rates.

12.7.2. STATIONARY SOURCE RESULTS

Summaries of the results of the stationary source construction-phase air quality modeling analyses for the Preferred Alternative and Alternatives SB1 and SB5 are provided in Table 12-10. The values shown are the maximum pollutant concentrations estimated at any receptor near the analysis site for all time frames that correspond to the NAAQS.

TABLE 12-10: HIGHEST PREDICTED STATIONARY SOURCE IMPACTS

Pollutant	Time Period	NAAQS (STV)	The Preferred Alternative	Alternative SB1	Alternative SB5
CO (ppm)	8 Hour	9.0	1.2	0.2	2.3
NO_2 (µg/m^3)	Annual	100	8.0	20.0	28.5
PM_{10} (µg/m^3)	24 Hour	150	59.8	22.4	24.5
$PM_{2.5}$ (µg/m^3)	24 Hour	65 (STV = 5)	14.8	3.4	7.0
	Annual Max	(STV = 0.3)	1.0	0.3	0.6

12.8. CUMULATIVE IMPACTS – MOBILE AND STATIONARY

Total impacts (stationary source plus mobile source) and total concentrations (total impacts plus background values) for each pollutant of concern are shown in Table 12-11. Total concentrations estimated near the analysis site do not exceed the NAAQS for CO, NO_2, or PM_{10}, but construction operations under the Preferred Alternative have the potential to exacerbate an exceedance of the annual $PM_{2.5}$ standard without the incorporation of mitigation measures. In addition, estimated project impacts (i.e., the differences in pollutant concentrations with and without construction activities) also exceed the NYSDEC Annual and 24-hour $PM_{2.5}$ STVs under the Preferred Alternative and Alternative SB5.

TABLE 12.11: HIGHEST PREDICTED TOTAL POLLUTANT IMPACTS AND TOTAL CONCENTRATIONS WITHOUT MITIGATION

Pollutant	Time Period	NAAQS (STV)	Total Highest Predicted Impacts and Concentrations					
			The Preferred Alternative		Alternative SB1		Alternative SB5	
			Max Impacts[1]	Max Total Conc.[2]	Max Impacts[1]	Max Total Conc.[2]	Max Impacts[1]	Max Total Conc.[2]
CO (ppm)	8 Hour	9.0	1.3	4.2	0.3	3.2	2.3	5.2
NO_2 (µg/m^3)	Annual	100	8.0	79.0	20.0	91.0	28.5	99.5
PM_{10} (µg/m^3)	24 Hour	150	59.9	105.9	22.5	68.5	24.6	70.6
For informational purpose only: **$PM_{2.5}$** (µg/m^3)	24 Hour	65 (STV = 5)	14.9**	52.9***	3.4	41.4***	7.1**	45.1***
	Annual Max	(STV = 0.3)	1.0**	15.3*	0.3	14.6	0.6**	14.9

Notes:
1. Includes maximum stationary and mobile source impacts.
2. Maximum total impacts plus background values.
* Exceeds NAAQS.
** Exceeds NYSDEC STV.
*** Exceeds the recently revised standard of 35 µg/m^3 but not the currently applicable standard of 65 µg/m^3.

As described earlier in this section, the project would not be considered a major source of $PM_{2.5}$ emissions, nor would the expected associated emissions be of a permanent nature. Construction-related $PM_{2.5}$ emissions would occur over a period of time that is below the regulated duration of 5 years. As such, the project is predicted to produce less than 15 tons per year and not require an NYSDEC permit.

Due to several factors (further described in Appendix B), higher levels of $PM_{2.5}$ emissions are predicted with the Preferred Alternative than the other alternatives as a result of higher levels of construction activity in the peak construction year. With mitigation measures, described in the next section, exceedances would be eliminated.

12.9. NYCT EMISSION REDUCTION REQUIREMENTS

The results of the previous impact analysis of construction activities indicate that during peak construction periods, a potential exists for $PM_{2.5}$ concentrations to exceed the NAAQS and for significant project-related $PM_{2.5}$ impacts (i.e., greater than the NYSDEC STVs) if no mitigation measures were applied. As such, NYCT will incorporate environmental performance requirements into the construction contracts for the emergency ventilation plant to minimize potential construction-phase air quality impacts.

These requirements will consist of measures to avoid or minimize potential adverse construction effects of the emergency ventilation plant on the environment, and would be implemented following NYCT's *Construction for the Environment* (CfE) guidelines. These guidelines propose the use of ULSD fuel emission equipment and retrofit technology during construction, coordination protocols and the implementation of a Construction Environmental Protection Program (CEPP). The emission reduction requirements would be implemented within the design and construction of the emergency ventilation plant to proactively reduce potentially adverse effects on air quality through the CEPP. The requirements include:

- Use of ULSD fuel in non-road vehicles with engine horsepower (HP) rating of 50 HP and above.
- Use of diesel engine retrofit technology in off-road equipment to reduce emissions further. NYCT will require that non-road vehicles of 50 HP and above are retrofitted with diesel oxidation catalysts (DOC), diesel particulate filters (DPF) or technology that achieves lowest particulate matter emissions. Based on currently available data, DPFs will be the preferred retrofit technology, with DOCs as a fallback when the use of DPFs is not practicable.
- Limiting of unnecessary idling times on diesel powered engines to three minutes.
- Locating diesel powered exhausts as far away as practicable from fresh air intakes or operable windows.
- Controlling construction-dust through a soil erosion sediment control plan that includes, among other things:
  - Spraying of a suppressing agent on dust pile (non-hazardous, biodegradable);
  - Containment of fugitive dust; and,
  - Adjustment for meteorological conditions as appropriate.

12.9.1. EMISSION RATES WITH NYCT EMISSION REDUCTION REQUIREMENTS

Stationary source emission rates that incorporate emission reduction efficiencies currently accepted by the regulatory agencies are shown in Table 12-12. The values in **Bold** are the highest annual emission rates per site per pollutant. While this table presents annual emission rates, the impact modeling analyses were based on both peak yearly and peak monthly emissions for each pollutant.

TABLE 12-12: ANNUAL EMISSION RATES FROM CONSTRUCTION EQUIPMENT AND ACTIVITIES WITH NYCT EMISSION REDUCTION REQUIREMENTS

Pollutant	Construction Area	Emissions (Tons/Year)				
		2010	2011	2012	2013	2014
CO	The Preferred Alternative	**1.033**	0.467	0.304	0.516	0.000
	Alternative SB1	**0.748**	0.345	0.642	0.712	0.429
	Alternative SB5	0.738	**1.041**	0.619	0.440	0.231
NO_2	The Preferred Alternative	**1.659**	0.721	0.559	1.056	0.000
	Alternative SB1	**1.392**	0.625	0.951	1.011	0.561
	Alternative SB5	1.255	**1.362**	0.802	0.709	0.312
PM_{10}	The Preferred Alternative	**0.291**	0.157	0.107	0.049	0.000
	Alternative SB1	0.195	**0.205**	0.143	0.121	0.016
	Alternative SB5	0.167	**0.232**	0.216	0.017	0.008
$PM_{2.5}$	The Preferred Alternative	**0.074**	0.036	0.025	0.023	0.000
	Alternative SB1	**0.052**	0.040	0.040	0.039	0.015
	Alternative SB5	0.047	**0.066**	0.050	0.016	0.008

Note: Values in **Bold** represent highest annual emission rates.

Mobile source emission rates, which are provided in Tables 12-7 and 12-8, were not mitigated because of the low project-related mobile source impacts predicted and the lack of cost-effective mobile source mitigation measures. Total mitigated impacts, therefore, include the results of the mitigated stationary source impacts and unmitigated mobile source impacts.

12.9.2. STATIONARY SOURCE ANALYSIS WITH NYCT EMISSION REDUCTION REQUIREMENTS

The same stationary source modeling impact analyses, using the EPA AERMOD dispersion model and five years of meteorological data for each analysis area, which were conducted using unmitigated stationary source emission rates, were conducted using mitigated on-site emission rates. No measures are proposed to mitigate mobile source impacts.

12.9.3. STATIONARY SOURCE RESULTS WITH NYCT EMISSION REDUCTION REQUIREMENTS

Summaries of the results of the stationary source construction-phase air quality modeling analyses for the Preferred Alternative and Alternatives SB1 and SB5 with the implementation of NYCT's package of mitigation measures are provided in Table 12-13. The values shown are the maximum project-related impacts estimated at any receptor (publicly accessible sidewalks and residences) for the time frames that correspond to the NAAQS. The result of this analysis is that project-related impacts do not exceed the NYSDEC STVs, which are used as indicator values in this analysis.

TABLE 12-13 HIGHEST PREDICTED STATIONARY SOURCE IMPACTS WITH NYCT EMISSION REDUCTION REQUIREMENTS

Pollutant	Time Period	NAAQS (STV)	The Preferred Alternative	Alternative SB1	Alternative SB5
CO (ppm)	8 Hour	9.0	0.7	0.1	0.2
NO_2 (μg/m^3)	Annual	100	7.4	1.6	2.5
PM_{10} (μg/m^3)	24 Hour	150	14.9	4.6	6.6
$PM_{2.5}$ (μg/m^3)	24 Hour	65 (STV = 5)	3.2	0.8	1.4
	Annual Max	(STV = 0.3)	0.20	0.07	0.12

12.10. CUMULATIVE IMPACTS—MOBILE AND STATIONARY—WITH NYCT EMISSION REDUCTION REQUIREMENTS

Total impacts (stationary source plus mobile source) and total concentrations (impacts plus background values) for each pollutant of concern with the implementation of NYCT's package of mitigation measures are shown in Table 12-14. Total estimated concentrations do not exceed any applicable NAAQS and the highest predicted impacts are less than the NYSDEC $PM_{2.5}$ STVs and the NYC CO *de minimis* impact thresholds.

TABLE 12.14: HIGHEST PREDICTED TOTAL POLLUTANT IMPACTS AND TOTAL CONCENTRATIONS WITH NYCT EMISION REDUCTION REQUIREMENTS

Pollutant	Average Period	Applicable NAAQS	Total Highest Predicted Impacts and Concentrations					
			The Preferred Alternative		Alternative SB1		Alternative SB5	
			Max Impacts[1]	Max Total Conc.[2]	Max Impacts[1]	Max Total Conc.[2]	Max Impacts[1]	Max Total Conc.[2]
CO (ppm)	8 Hours	9.0	0.7	3.6	0.2	3.1	0.3	3.2
NO_2 (μg/m^3)	Annual	100	7.4	78.4	1.6	72.6	2.5	73.5
PM_{10} (μg/m^3)	24 Hours	150	15.0	61.0	4.7	50.7	6.7	52.7
$PM_{2.5}$ (μg/m^3)	24 Hours	65 STV = 5	3.3	41.3*	0.9	38.9*	1.5	39.5*
	Annual Max	NYSDEC STV = 0.3	0.20	14.5	0.07	14.4	.12	14.4

* Exceeds the recently revised standard of 35 μg/m^3 but not the currently applicable standard of 65 μg/m^3.

Notes:

1. Includes maximum stationary and mobile source impacts.
2. Maximum total impacts plus background values.

12.11. SUMMARY OF RESULTS WITH THE IMPLEMENTATION OF NYCT EMISSION REDUCTION REQUIREMENTS

The construction and operation of the proposed ventilation plant alternatives, with the implementation of NYCT construction-phase emission reduction requirements, would not cause an exceedance of any NAAQS used in this analysis. In addition, the highest predicted project-related impacts are less than the NYSDEC $PM_{2.5}$ STVs, which are used as indicator values in this analysis. As such, the air quality impacts of the project, with the implementation of NYCT's construction-phase emission reduction requirements, are not considered to be significant.